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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/750,141	12/31/2003	Mineo Yamakawa	21058/0206675-US0	7926
75172	7590	01/08/2008	EXAMINER	
Intel Corporation c/o DARBY & DARBY P.C. P.O. BOX 770 CHURCH STREET STATION NEW YORK, NY 10008-0770			MCCRACKEN, DANIEL	
			ART UNIT	PAPER NUMBER
			1793	
			MAIL DATE	DELIVERY MODE
			01/08/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/750,141	<b>Applicant(s)</b> YAMAKAWA ET AL.	
	<b>Examiner</b> Daniel C. McCracken	<b>Art Unit</b> 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 10/17/2007.
- 2a) ☐ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-4,8,9,11,15-21 and 39-41 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4,8,9,11,15-21 and 39-41 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

Citation to the Specification will be in the following format (S. # : ¶) where # denotes the page number and ¶ denotes the paragraph number. Citation to patent literature will be in the form (Inventor # : LL) where # is the column number and LL is the line number. Citation to the pre-grant publication literature will be in the following format (Inventor # : ¶) where # denotes the page number and ¶ denotes the paragraph number.

### ***Response to Arguments***

Applicant's arguments filed 10/17/2007 have been fully considered but they are not persuasive. While not necessarily agreeing with Applicants possession of anything beyond a collection of journal articles, the written description rejection under 35 U.S.C. 112, ¶1 is withdrawn. Discussion of the declaration and remaining rejections appears forthwith.

### **1.132 Declaration**

Applicants declaration has been considered, but is not persuasive. It is noted that the affiant is not an entirely disinterested party, being an employee of the assignee of the instant invention. The affidavit was less persuasive for at least this reason. Further, the testimony as to the ultimate legal issues surrounding 35 USC 112 are not entitled to any weight. *In re Chilowsky*, 134 USPQ 515 (CCPA 1962). The underlying factual statements of the affiant however have been considered and given weight, but are not persuasive, at least with respect to the enablement rejection. The Examiner may agree that the Declarant, by their own definition set forth in paragraph 5, is one of ordinary skill in the art. As such, a declaration that would have detailed how the declarant practiced the claimed invention based on the content of the disclosure would

have been most helpful. Instead, the declaration makes blanket statements that methods were disclosed. *See e.g.* Paragraph 8 – what methods are disclosed in paragraph [0026] of the specification? Is it the vague “Many techniques . . . are known and used in the disclosed methods” language? (S. 7: [0026]). The Examiner considers this essential matter. If these methods are disclosed in any of the numbers academic journal articles cited, this is improper incorporation by reference. *See* 37 C.F.R. 1.57. Furthermore, there is no clear line drawn between ordinary, known chemistry of atoms and nanotechnology. Can the ‘nanoparticles’ be individual atoms? Or is some degree of structure implied? For example, one can readily deposit a Pt metal atom(s) in an anodized alumina substrate well and add an amine, knowing that the Pt-N bond is strong and thus the equilibrium condition is the N-head bonded to the Pt. Is this within the scope of the claims?

However, the Examiner gives great weight to the following statements, made under penalty of perjury.

1. In my opinion, based on my experience in biochemistry and materials science and the high level of skill in these arts, one of ordinary skill would know how to attach catalyst nanoparticles to biomolecules with a defined spacing between the nanoparticles.. As taught in the specification, the modification of biomolecules at, e.g., specific amino acid and/or nucleotide sites, and the attachment of nanoparticles, e.g., protein- based nanoparticles such as biotinylated ferritin to these specific sites was *well known in the prior art*. (Declaration, ¶9).
2. The specification cites a number of references that describe the application of these alignment techniques to biomolecules. *These techniques are routine* in the art of biochemistry and materials science. The specification cites a number of references that describe the application of these alignment techniques to biomolecules. *These techniques are routine* in the art of biochemistry and materials science. (Declaration, ¶11).
3. *These techniques are routine in the art* of biochemistry and materials science. (Declaration, ¶11).

Applicants arguments with respect to the enablement rejection have been considered but are not persuasive. The paragraphs offered as providing guidance (e.g. [0026]-[0028]) provide nothing more than statements to the effect of "It can be done." The Examiner – as noted in the discussion of the declaration – would gladly withdraw the rejection if a declaration was presented that showed Dr. Wu (one of ordinary skill in the art) practiced the claimed invention based on the disclosure provided. The declaration should include the amount and nature of experimentation conducted.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-4, 8-9, 11, 15-21, and 39-41 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The analysis as set forth in the non-final office action of 5/17/2007 is expressly incorporated herein by reference. It is noted that Applicants have now claimed a process with greater precision than originally claimed. *See e.g.* Claim 1 (claiming the ability to attach at least two catalyst particles at defined locations). This goes to the enablement rejection – specifically the inquiries directed at the direction provide by applicants and examples/reduction to practice.

How would one of ordinary skill place the catalyst at specific locations on the biomolecule. Reciting "known" techniques is not enough. The Examiner expects citation to journal articles.

This rejection can be obviated by an appropriate affidavit that shows this was accomplished by Dr. Wu. The declaration should include the nature and amount of experimentation conducted.

***Claim Rejections - 35 USC § 103***

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1-4, 8-9, 11, 15-21, and 39-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,515,339 to Shin, et al. and US 6,737,939 to Hoppe in view of Applicants admissions. Reference will be made to the admissions as set forth in the non-final office action of 5/17/2007.

With respect to Claims 1-4 and 8-9, and 39 the Examiner takes official notice that growth of carbon nanotubes on substrates in predetermined patterns is old and known. In support of taking official notice (i.e. in making sure there is "substantial evidence" on the record), the Examiner cites to the following:

1. US 6,515,339 to Shin, et al., col. 3 (describing the formation of catalysts at specific locations).
2. US 6,737,939 to Hoppe, col. 10, lines 44 *et seq.* (describing catalyst deposition by sputtering, electron beam evaporation or other suitable techniques).

Thus, the state of the art recognizes the need for depositing catalysts at specified locations on a substrate. Stated differently, there is an implicit motivation in the art to be able to attach catalysts at specific locations on substrates.

Attachment of biomolecules to a substrate is old and known. (Admission 8). As to Claims 1, 17, 19, and 21 Applicants' Expert has stated under penalty of perjury that attachment of catalysts to biomolecules is old and known. *See* (Declaration, ¶9) ("protein- based nanoparticles such as biotinylated ferritin to these specific sites was *well known in the prior art.*") (emphasis added). As to Claims 1 and 40, the removal of the polymer (at an appropriate temperature that does not damage the substrate) before CVD would be obvious for any number of reasons, for example insuring that only the desired reactions (nanotube growth) occur during CVD. As to Claim 15-16, alignment techniques are admittedly old and known. (Admission 20). As to Claim 18, CVD is old, known, and "the most suitable for nanotube production." (Hoppe 2: 26-27). As to Claim 20 silicon oxide substrates are recited (Hoppe 4:37). As to Claim 41, use of single stranded DNA is an obvious expedient.

It is noted that Applicants counsel has stated on and for the record that "[t]he techniques required to practice each step called for in the pending claims are *highly predictable based on the large body of literature that was available to one of skill in the art at the time the application was filed.*" Remarks of 10/17/2007, p. 21. (emphasis added). Regrettably, implementation of predictable variations motivated by design incentives and other market forces does not impart patentability. *KSR International Co. v. Teleflex Inc.*, 82 USPQ2d 1385, 1396 (US 2007).


### ***Conclusion***

The Examiner expects a full reply *and* affidavit addressing the enablement rejection. Alternatively, the Examiner would welcome a demonstration of the technology. All amendments made in response to this Office Action must be accompanied by a pinpoint citation to the Specification (i.e. page and paragraph or line number) to indicate where Applicants are drawing their support.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel C. McCracken whose telephone number is (571) 272-6537. The examiner can normally be reached on Monday through Friday, 9 AM - 6 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley S. Silverman can be reached on (571) 272-1358. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



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